

Patent claims

1. Process for the placement and fixing of a sheet, which is at least partially implemented as a dense flat structure, of filaments, lying essentially in a plane, for the production of scrims having the filament sheet, wherein the filament sheet is placed, as part of the filament sheet sections (1) forming a closed surface and as separate filament sheet sections, between two conveyor units (13) supplying a connecting station (6), with the filament sheet sections (1), being fixed onto the conveyor unit at each of both end regions with a fixing element (2, 3) and the interval of the fixing elements (2, 3) of a filament sheet section (1) relative to the conveyor units (13) being selected in such a way that the filament sheet sections (1) are, in their fixed state, positioned essentially flat between the conveyor units (13), at least immediately before entering the connecting station (6).
2. Process according to claim 1, wherein, for diagonal placement of the filament sheet sections (1), the fixing elements (2, 3) are attached at a selectable angle to the lengthwise direction of the filament sheet section (1).
3. Process according to claim 1 or 2, wherein the fixing elements (2, 3) are hung on holding needles 8 affixed to the conveyor units (13).
4. Process according to one of the preceding claims 1 to 3, wherein the fixing elements (2, 3) are produced by embedding the end regions of the filament sheet sections (1) in a rapidly hardening plastic.
5. Process according to one of the claims 1 to 3, wherein the fixing elements (2, 3) are produced by gluing the end regions of the filament sheet sections (1).
6. Process according to one of the claims 1 to 5, wherein the steps are performed as follows at least once:
 - a. Attachment of a first fixing element (2) to the filament sheet;
 - b. Gripping the first fixing element (2) and moving the fixing element (2) a preset distance;

- c. Application of a second fixing element (3) to form the first filament sheet section (1) and, simultaneously, a first fixing element (2') for the subsequent filament sheet section;
- d. Cutting off the first filament sheet section and hooking or pressing the fixing element into the respective holding needles (8) or, conversely, first hooking or pressing and then cutting off the filament sheet section.

7. Process according to claim 6, wherein a preset filament sheet tension is applied to the filament sheet section between the cutting and the hooking and/or pressing in step d.

8. Process according to one of the preceding claims 1 to 7, wherein the filament sheet sections are produced in coordination with the supply speed of the holding needles.

9. Process according to one of the claims 1 to 8, wherein several filament sheet sections can be fixed on top of one another.

10. Process according to one of the claims 1 to 9, wherein the filament sheet consists of at least 10^4 filaments per cm of width and/or of heavy tows.

11. Device for the placement and fixing of a sheet, which is at least partially implemented as a dense flat structure, of filaments, lying essentially in a plane, on conveyor chains (15) continuously supplying a connecting station (6) for the production of a scrim having the filament sheet, with a placement unit (4) for placement of the filament sheet, with a holding unit (5) for at least temporary fixing of the placed filament sheet, and with a connecting station (6), particularly for the performance of the process according to one of the claims 1 to 10, **characterized in that** a unit (7) is provided for the production of premanufactured filament sheet sections (1) which have their ends held by means of fixing elements (2, 3) at a preset interval a and the holding unit (5) is affixed to the conveyor chains (15) in such a way that the filament sheet is held, at least at the connecting station (6), in such a way that it is implemented there as an essentially flat surface.

12. Device according to claim 11, characterized in that the holding unit (5) has at least one row of holding needles (8) into which the fixing elements (2, 3) can be hooked or pressed.

13. Device according to claim 11 or 12, characterized in that the placement unit (4) is a gripper unit (9), which can be moved and lowered, having at least one presser (10), one gripper (12), and one cutting knife (11).

14. Device according to claim 12 or 13, characterized in that the holding needles (8) are located below rows of guide needles (14) and are curved outwards.

15. Device according to one of the claims 11 to 14, characterized in that the holding needles (8) are of a length such that multiple fixing elements can be hooked in on top of one another.

16. Device according to one of the claims 11 to 15, characterized in that the interval between opposing holding needles (8) in the movement direction of the conveyor chains increases for pretensioning of the filament sheet sections (1).

17. Device according to one of the claims 11 to 15, characterized in that the holding unit (5) has two opposing rows of guide needles (14) which supply the connecting station synchronously (6) and one row of holding needles (8) each.

18. Device according to one of the preceding claims 12 to 17, characterized in that the fixing elements (2, 3) are fused, embedded, and/or glued, or frozen onto the filament sheet sections (1) with the unit (7) for production of the filament sheet sections (1).

19. Device according to claim 18, characterized in that an angle can be set with which the fixing elements (2, 3) can be attached to the filament sheet section (1).

20. Device according to one of the claims 11 to 19, characterized in that a control unit (20) is provided for control of the placement unit (4) and the unit (7) for production of the filament sheet sections (1).